

Also
cont.

52. (Amended) The mesostructured material according to claim 51, wherein the direction of the molecular chains' orientation and the direction of the tubular mesopores are orthogonal.

Kindly add new claims 55-57 as follows:

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55. (New) A mesostructured material having mesopores, the mesostructured material being arranged on a polymeric surface constituted of a polymeric compound, wherein the mesopores are oriented in a first direction parallel to the surface and the polymeric compound of the polymeric surface is oriented in a second direction.

56. (New) The mesostructured material according to claim 55, wherein the polymeric surface is constituted of a Langmuir-Blodgett film.

57. (New) The mesostructured material according to claim 55, wherein the polymeric surface is a film formed by transferring a monomolecular film developed on an aqueous surface onto a substrate.

REMARKS

The claims at issue are 1-23, 48-52 and 55-57, with claims 1, 13 and 55 being independent. Claims 24-47, 53 and 54 have been withdrawn from consideration as directed to the non-elected invention.

Claim 1 has been amended to better define the present invention. Support for this amendment may be found throughout the specification and the drawings, for

example in Fig. 3 and on pages 10 through 17. Claims 3, 7, 8, 13 and 48-52 have been amended to resolve section 112 issues.

New claims 55-57 have been added. Support of these claims may be found in the drawings, the specification and the claims. No new matter has been introduced by the amendments to claims 1, 3, 7, 8, 13 and 48-52 and the addition of claims 55-57.

Reconsideration of the present claims is expressly requested.

The drawings are objected to under 37 C.F.R. § 1.83(a). Specifically, the Examiner alleged that they do not show the subject matter of claims 3-5. Applicants respectfully disagree.

Fig. 3 and the corresponding description in the specification on page 16, line 15, through page 16, line 21, clearly show the features of claims 3-5. Accordingly, this objection should be withdrawn.

The specification is objected to because of minor informalities in the abstract. Applicants have amended the abstract to correct the informalities without adding any new matter. Withdrawal of this objection is therefore respectfully requested.

Claims 1-23 and 48-52 stand rejected under 35 U.S.C. § 112, first paragraph, as being allegedly non-enabling.

With respect to the orientation of the polymeric chains, claim 3 has been amended to clarify that "polymer chains of the polymeric compound on the polymeric surface are oriented in [towards] a second direction [parallel to the surface]".

With respect to the Examiner's reference to the differences between the first and second directions, Applicants respectfully submit that the specification on pages 9 through 21 provides a clear description as to how these directions can be different. For example, the orthogonal relationship between the first and second directions is described on page 16, line 15, through page 16, line 21, and is shown in Fig. 3.

With respect to the Examiner's objections to the phrase "prescribed direction", claims 7, 8 and 48-52 have been amended to delete this allegedly offensive phrase.

With respect to the Examiner's allegation regarding the Langmuir-Blodgett (LB) film, the Examiner will note that the LB film is a film formed by specific methods that are well-known in the art. Some of these methods are clearly described on pages 12-16 of the specification. Thus, claims 6 and 19 are proper product-by-process claims.

Claims 1-23 and 48-52 also stand rejected under 35 U.S.C. § 112, first paragraph, as being allegedly based on non-enabling disclosure. In particular, the Examiner alleged that the size of the mesopores is a critical feature, which is essential to the practice of the present invention, and therefore must be recited in the claims. Applicants respectfully disagree.

The Examiner did not provide a single reason to support this enablement rejection. As a matter of law, the Examiner must provide a reasonable explanation as to why a scope of protection provided by a claim is not adequately enabled by the disclosure. See In re Wright, 27 U.S.P.Q.2d (BNA) 1510, 1513 (Fed. Cir. 1993); M.P.E.P. § 2164.04. Thus, the Examiner clearly has not met the initial burden of establishing a reasonable basis to question the enablement provided for the claimed invention.

Nonetheless, Applicants respectfully submit that the size of the mesopores is not critical to practicing the present invention. While it is known in the art that the mesopores are generally 2nm to 50nm, Applicants do not believe that the mesopores in the present invention must be limited to a specific size.

Withdrawal of all section 112, first paragraph, rejections is respectfully requested.

Claims 6 and 13-23 stand rejected under 35 U.S.C. § 112, second paragraph, as being allegedly indefinite. In particular, the Examiner alleged that "Langmuir-Blodgett" film in claims 6 and 19 is a trademark.

Applicants respectfully submit that the LB film is not a trademark, but a type of film that is formed by specific methods well-known in the art and exemplified in the specification on pages 12-16, as discussed above. Thus, claims 6-19 are proper product-by-process claims.

The Examiner also alleged that the term "rod-like" in claim 13 is indefinite. Claim 13 has been amended to delete this term. Withdrawal of the indefiniteness rejections is respectfully requested.

Claims 1-5, 7-9, 11-18, 20, 23 and 48-52 stand rejected under 35 U.S.C. § 102(e) as being allegedly anticipated by U.S. Patent No. 6,027,666 (Ozin). Claims 10 and 21 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Ozin in view of U.S. Patent No. 6,171,687 (Leung). Claim 22 stands rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over Ozin in view of U.S. Patent No. 4,919,810 (Itoh). The grounds of rejection are respectfully traversed.

The present invention is directed to a mesostructure that is arranged on a polymeric surface, which is made of a polymer compound. The polymer chains or molecules of the polymeric compound are oriented in one direction.

Ozin is directed to materials comprising stabilized luminescent silicon clusters. Ozin, however, does not disclose, teach or suggest that the mesostructure is arranged on a polymeric surface made of a polymer compound whose chains or molecules are oriented in one direction.

The Examiner alleged that Ozin, at column 5, lines 28-32, discloses that the mesostructured material is arranged on a polymeric surface. This portion of Ozin, however, merely states that a polymerizable silica derivative and a surfactant are mixed in

an aqueous solution and stirred at room temperature. While Ozin later teaches that the final mixture is transferred to a plastic bottle and water and is then peeled off from the bottle, this reference does not disclose, teach or suggest that the polymeric chains or molecules on the surface of this bottle are oriented in one direction.

The Examiner alleged that Ozin, at column 2, lines 15-18, teaches that chains of the polymer material are oriented in a first direction parallel to the polymeric surface. Applicants respectfully disagree.

Ozin, at column 2, lines 15-18, states: "[t]he films have parallel channels of generally hexagonal cross-section, running predominantly parallel to the surface." However, these films are not a polymeric surface of the present invention. The film Ozin refers to is mesoporous silica (see col. 2, lines 8-12).

Further, with respect to claim 11, the Examiner alleged that Ozin teaches that the polymeric surface is constituted of a polymeric film arranged on a substrate, and the mesostructured material is formed on a free surface of the polymeric film.¹ Again, Applicants disagree.

Ozin, at column 6, lines 12-18, merely teaches that mesoporous silica may be made in free standing form and can be lifted intact off the water surface. It does not teach or suggest that the mesostructured material is formed on a free surface of a polymeric film.

In sum, it is clear that Ozin does not disclose, teach or suggest the mesostructure arranged on a polymeric surface made of a polymer compound whose chains or molecules are oriented in one direction, as is presently claimed. Accordingly, Ozin cannot anticipate the present invention.


¹/The Examiner referred to the disclosure in Ozin at column 6, lines 12-18.

The deficiencies of Ozin cannot be cured by Leung or Itoh. The Examiner cited Leung for its alleged teaching of a polymeric surface containing a polyimide. Itoh was cited for its alleged disclosure of hollow mesopores. However, even if assumed, arguendo, that Leung and Itoh contain the teachings alleged by the Examiner, these references do not teach or suggest the same features of the presently claimed invention that are missing in Ozin, i.e., the mesostructure arranged on a polymeric surface made of a polymer compound whose chains or molecules are oriented in one direction. Thus, the presently claimed invention is patentable over Ozin, Leung and Itoh, whether these patents are considered separately or in any combination.

Applicants respectfully request that all rejections and objections be withdrawn and the present case passed to issue.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,



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APPENDIX

Application No. 09/478,884
Attorney Docket No. 03500.014215

IN THE ABSTRACT:

The abstract has been amended as follows:

A mesostructured material, which has [having] plural tubular mesopores and [which] is arranged on a polymer surface, characterized in that the mesopores are oriented in one direction parallel to the surface. The mesostructured material is [can be] developed to functional devices.

IN THE CLAIMS:

Claims 1, 3, 7, 8, 13 and 48-52 have been amended as follows:

1. (Amended) A mesostructured material having tubular mesopores, the mesostructured material being arranged on a polymeric surface constituted of a polymeric compound, wherein the tubular mesopores are oriented towards a first direction parallel to the surface and the polymeric surface has been subjected to an alignment control treatment.

3. (Amended) The mesostructured material according to claim 1 or 2, wherein polymer chains of the polymeric compound on the polymeric surface are oriented in [towards] a second direction [parallel to the surface].

7. (Amended) The mesostructured material according to claim 1, wherein the polymeric surface has been rubbed [in a prescribed direction].

8. (Amended) The mesostructured material according to claim 7, wherein the polymeric surface has been rubbed in [prescribed direction is the same direction as] the first direction.

13. (Amended) A mesostructured silica arranged on a polymer material surface, in which chains of the polymer material are oriented in [to] a first direction parallel to the polymer material surface, having tubular mesopores, wherein the tubular mesopores are oriented in [to] a second direction nearly perpendicular to the first direction, and the oriented tubular mesopores are formed on the polymer material surface by locating silica outside of an oriented [rod-like] surfactant micelle structure of which orientation is determined by parallel accommodation of molecules of the surfactant on the chains of the polymer material through chemical interaction.

48. (Amended) A mesostructured material having tubular mesopores, the mesostructured material being arranged on a polymeric surface, wherein the tubular mesopores are oriented in [towards] a [prescribed] direction parallel to the surface, and the direction is determined by a direction of a rubbing treatment of the polymeric surface.

49. (Amended) The mesostructured material according to claim 48, wherein the rubbing direction is identical to [with] the [prescribed] direction of the tubular mesopores.

50. (Amended) A mesostructured material having tubular mesopores, the mesostructured material being arranged on a polymeric surface constituted of a polymeric compound, wherein the tubular mesopores are oriented in [towards] a [prescribed] direction parallel to the surface, and the direction is determined by an orientation direction of the polymeric compound's polymer chain.

51. (Amended) The mesostructured material according to claim 50, wherein the direction of the polymer chains' orientation and the [prescribed] direction of the tubular mesopores are different from each other.

52. (Amended) The mesostructured material according to claim 51, wherein the direction of the molecular chains' orientation and the [prescribed] direction of the tubular mesopores are orthogonal [each other].